

What is claimed is:

1. A polymeric reference electrode membrane,
comprising (a) one selected from a porous polymer or a
5 hydrophilic plasticizer and (b) a lipophilic polymer.

2. The membrane as set forth in claim 1, wherein the
polymeric reference electrode membrane comprises a porous
polymer and a lipophilic polymer.

3. The membrane as set forth in claim 1, wherein the
polymeric reference electrode membrane comprises a
hydrophilic plasticizer and a lipophilic polymer.

4. The membrane as set forth in claim 1, wherein the
porous polymer is selected from the group consisting of
cellulose acetate, cellulose acetate butylate, cellulose
triacetate, nitro cellulose and a combination thereof.

5. The membrane as set forth in claim 1, wherein the
hydrophilic plasticizer is selected from the group
consisting of glycerol, polyethylene glycol, ethylene glycol
monomethyl ether, ethylene glycol, formamide and a
combination thereof.

6. The membrane as set forth in claim 1, wherein the lipophilic polymer is selected from the group consisting of silicone rubber, poly (vinyl chloride), polyurethane, poly (vinyl chloride) carboxylated copolymer, poly (vinyl chloride-co-vinyl acetate-co-vinyl alcohol) and a combination thereof.

7. The membrane as set forth in claim 2, wherein the polymeric reference electrode membrane comprises 5-70 % by weight of the porous polymer and 30-95 % by weight of the lipophilic polymer.

8. The membrane as set forth in claim 2, wherein the polymeric reference electrode membrane comprises 10-50 % by weight of the porous polymer and 50-90 % by weight of the lipophilic polymer.

9. The membrane as set forth in claim 3, wherein the polymeric reference electrode membrane comprises 20-70 % by weight of the hydrophilic plasticizer and 30-80 % by weight of the lipophilic polymer.

10. The membrane as set forth in claim 1, wherein the polymeric reference electrode membrane further contains an adhesion-enhancing material at an amount of 0.001-1.0 % by

weight on the total weight of composition.

11. The membrane as set forth in claim 10, wherein the
adhesion-enhancing material is highly reactive silicon
5 compound selected from the group consisting of diluted
silicon tetrachloride (SiCl_4), aminopropyltriethoxy silane,
N-[3(trimethoxysilyl)propyl]ethylenediamine, N(2-
aminoethyl)-3-aminopropyltrimethoxy silane, 3-
methacryloxypropyltrimethoxy silane, N-(2-
10 vinylbenzylamino)ethyl)-3-aminopropyl trimethoxysilane, 3-
glycidoxypopyltrimethoxy silane, methyltrimethoxy silane
and phenyltrimethoxy silane.

12. A conventional-type reference electrode equipped
15 with the polymeric reference electrode membrane of claim 1,
comprising an inner reference electrode **3** positioned at the
center within the reference electrode; an inner reference
electrolyte **7** filling the internal space of the reference
electrode; and a polymeric reference electrode membrane **8**
20 mounted to an end of the electrode.

13. The electrode as set forth in claim 12, wherein
the polymeric reference electrode membrane **8** comprises a
porous polymer and a lipophilic polymer, and the inner
25 reference electrode **3** is made of silver/silver chloride.

14. The electrode as set forth in claim 12, wherein the polymeric reference electrode membrane **8** comprises a hydrophilic plasticizer and a lipophilic polymer, and the inner reference electrode **3** is made of silver/silver chloride.

15. The electrode as set forth in claim 12, wherein the inner reference electrolyte **7** is an aqueous solution of a salt selected from the group consisting of KCl, NaCl, KNO₃ and NH₄NO₃, each of which is similar in mobility.

16. The electrode as set forth in claim 12, wherein the inner reference electrolyte **7** is a hydrogel obtained by dissolving 1-15 % by weight of a hydrophilic polymer in 0.01-3.0 M aqueous solution saturated with a salt selected from the group consisting of KCl, NaCl, KNO₃ and NH₄NO₃, each of which is similar in mobility.

17. The electrode as set forth in claim 16, wherein the hydrophilic polymer is selected from the group consisting of polyvinylpyrrolidone, polyvinyl alcohol, poly(methyl methacrylate), agar, gelatin.

18. A solid-state reference electrode equipped with

the polymeric reference electrode membrane of claim 1, comprising a) a substrate **10**; b) an insulating film layer **9** formed on the substrate; c) a reference electrode material **11** insulated by the insulating film layer **9** in aqueous solutions; and d) a polymeric reference electrode membrane **8** fixed to the reference electrode material **11**.

19. The electrode as set forth in claim 18, wherein the polymeric reference electrode membrane is one selected from a polymeric reference electrode membrane comprising a porous polymer and a lipophilic polymer or a polymeric reference electrode membrane comprising a hydrophilic plasticizer and a lipophilic polymer; and as the polymeric reference electrode membrane **8** is additionally fixed to the hydrogel layer **12**, thereby the reference electrode material **11** is protected by the double layered and is made of silver/silver chloride.

20. The electrode as set forth in claim 18, wherein the polymeric reference electrode membrane is a mono-layered polymeric reference electrode membrane **13** comprising a hydrophilic plasticizer and a lipophilic polymer, and is covered with the reference electrode material **11**, thereby the reference electrode material **11** is protected by the mono-layered and is made of silver/silver chloride.

21. The electrode as set forth in claim 20, wherein the mono-layered polymeric reference electrode membrane **13** comprises 20-70 % by weight of a hydrophilic plasticizer saturated with a salt selected from the group consisting of KCl, NaCl, KNO₃ and NH₄NO₃ and 30-80 % by weight of a lipophilic polymer.

22. The electrode as set forth in claim 18, wherein the substrate **10** is made of a material selected from the group consisting of alumina-containing ceramics, silicon, poly (vinyl chloride), polyester, polycarbonate and semiconductor materials.

23. The electrode as set forth in claim 18, wherein the hydrogel layer **12** is prepared by dissolving a hydrophilic polymer at an amount of 1-15 % by weight in a 0.01-3.0 M aqueous solution saturated with a salt selected from the group consisting of KCl, NaCl, KNO₃ and NH₄NO₃, each of which is similar in mobility.

24. The electrode as set forth in claim 23, wherein the hydrophilic polymer is selected from the group consisting of polyvinylpyrrolidone, polyvinyl alcohol, poly(methyl methacrylate), agar, gelatin and mixtures

thereof.

25. A potentiometric sensor comprising the solid-state
reference electrode of claim 18 and a working electrode of a
5 set of ion-selective electrodes.